

New Sheet

Leak Testing Failure Modes						
Mode 1	MS Test	WS1 Test	WS2 Test	Seal Test	Possible Failure	Most Likely Failure
1	F	F	F	F	1. Any Component from Each Test	1. Transducer 2. SSV Valve 3. Inject Valve 4. Fittings: Inj. Valve Port 2-SSV Valve Port2 Same as Possible
2	F	F	F	P	1. T15 (WK WSH VLV) 2. T19 (STG WSH VLV) 3. T21 (WSH SLC VLV)	4. WS2 Syringe 5. Fittings: WS2 Port 2-Inj. Valve 6. Intermittent Failure MS Test Components
3	F	F	P	F	1. Sample Syringe 2. T16 (WSH BLK VLV) 3. T15 (WK WSH VLV) 4. WS1	5. Seal 6. Regulator 7. Fittings: WS1-Manifold, WS1-Inj Valve Port 1
4	F	F	P	P	1. T15 (WK WSH VLV) 2. Fittings: WS1-Manifold 3. Intermittent Failure MS Test Components	Same as Test 11
5	F	P	F	F	1. Sample Syringe 2. T19 (STG WSH VLV) 3. WS2 4. Seal	5. Regulator 6. Fittings: WS2-Manifold, Manifold-Inj Valve Port 1 7. Intermittent Failure WS2 Components
6	F	P	F	P	1. T19 (STG WSH VLV) 2. WS2 3. Fittings: WS2-Manifold 4. Intermittent Failure MS Components	Same as Test 14
7	F	P	P	F	1. Sample Syringe 2. Seal 3. Regulator 4. Fittings: Manifold-Inj Valve Port 1	1. Sample Syringe 2. Fitting: Inj Valve Port 1-SSV Port 3
8	F	P	P	P	1. Intermittent Failure Any Component of MS Test	Same as Possible
9	P	F	F	F	1. WS1 2. T16 (WSH BLK VLV) 3. T15 (WK WSH VLV) 4. T21 (WSH SLC VLV)	5. WS2 6. Regulator 7. Seal 8. Fittings: WS1-SSV Port 2, WS2-SSV Port 2, WS1-Inj Valve
10	P	F	F	P	1. T15 (WK WSH VLV) 2. T19 (STG WSH VLV) 3. T21 (WSH SLC VLV) 4. WS2	1. T21 2. Fittings: Manifold-SSV Port 2
11	P	F	P	F	1. WS1 2. T16 (WSH BLK VLV) 3. T15 (WK WSH VLV) 4. Seal	1. WS1 2. T16 3. Fittings: WS1-Manifold
12	P	F	P	P	1. T15 (WK WSH VLV) 2. Fittings: WS1-Manifold	Same as Possible
13	P	P	F	F	1. WS2 2. T19 (STG WSH VLV) 3. Seal 4. Regulator	Same as Possible
14	P	P	F	P	1. WS2 2. T19 (STG WSH VLV) 3. Fittings: WS2-Manifold 1	Same as Possible
15	P	P	P	F	1. Seal 2. Regulator 3. Fittings: Manifold-Inj Port 1	Same as Possible
16	P	P	P	P	All Components Working Order	Same as Possible
Analysis Assumes the Tests are Run in MS - Seal Order and the Tests look at Pressure and Leak Rate only Failure Mode not Likely Unless Intermittent Failure						

FIG. 6E